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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/196,064 | 11/19/1998 | HARM J. W. BELT | PHN16.638 | 8724 |

24737 7590 08/26/2003

PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

EXAMINER

LAO, LUN S

| ART UNIT | PAPER NUMBER |
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2643

DATE MAILED: 08/26/2003

23

Please find below and/or attached an Office communication concerning this application or proceeding.

gj

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|------------------------------|-----------------|--------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 09/196,064 | BELT ET AL. |
| Examiner | Art Unit | |
| Lun-See Lao | 2643 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 05 August 2003.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-10 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-10 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.

2. Certified copies of the priority documents have been received in Application No. _____.

3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.

4) Interview Summary (PTO-413) Paper No(s) _____.

5) Notice of Informal Patent Application (PTO-152)

6) Other: _____.

DETAILED ACTION

Introduction

1. This communication is responsive to the applicant's amendment filed 08/05/2003.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-2, 4-5 and 7-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Oh (US PAT 5,353,376).

Consider claim 1, Oh teaches an audio arrangement for a Delay-Sum type Beamformer that utilizes an energy transfer function for delay compensation, said arrangement comprising:

a plurality (see fig.1, (10)) of audio sources generating input audio signals;
a processor (16) operable to derive a processed audio signals from the input audio signals;
a combiner (20, summer) operable to derive a combined audio signal from the processed audio signals; and
a based controller (14) operable to control the processor in order to maximize (larger) a power measure of the combined audio signal, wherein the controller is

arranged to limit (minimize) a combined (28) power gain measure of the processed audio signals to a predetermined value (16, predetermined of period of time) without measuring an energy transfer at each site where one respective audio source of the plurality of audio sources receives the input audio signals (see col.3 line 10-col.4 line 5).

Consider claim 2, Oh teaches the audio processing arrangement of the processor includes a scaling means (see fig.1, (10) for scaling different distances from audio source to a microphone)) for scaling the input audio signals with a scaling factor (microphone) for obtaining the processed audio signal, said controller (14) includes a further scaling means ((10) for scaling different distances from audio source to a microphone) for deriving a plurality of scaled combined audio signals with a scaling factor (microphone) corresponding to the scaling factor of the scaling means ((10) for scaling different distance from audio source to a microphone), and in that the controller (14) is arranged for maximizing (larger) a power measure of the combined audio signal, and for limiting (minimize) a combined power gain measure of the processed audio signals by minimizing a difference between the input audio signals and the scaled combined audio signals corresponding to said audio signals (see col.3 line 13-col.4 line 15).

Consider claims 4-5 and 7, Oh teaches the audio processing arrangement of the audio processing arrangement comprises a delay elements (see fig.1, (16)) for compensating a delay difference of a common audio signal present in the input audio signals (see col.3 lines 13-63); and the audio processing arrangement of the audio

sources comprise a plurality of microphones (see fig.1, 10), and in that the microphones are placed in a position such that their directionality patterns are substantially disjunct (10); and the audio processing arrangement of the audio sources comprise a plurality of microphones being placed in a linear array (see fig.10).

Consider claim 8, Oh teaches an audio signal processing arrangement for a Delay-Sum type Beamformer that utilizes an energy transfer function for delay compensation (see col.3 lines 48-53), said arrangement comprising a plurality of inputs (see fig.1, (10)) for receiving input audio signals, processing means (16) for deriving processed audio signals, the audio processing arrangement comprising combining means (20) for deriving a combined audio signal from the processed audio signals (16), wherein the audio processing arrangement comprises a control means (14) for controlling the processing means (16) in order to maximize (larger) a power measure of the combined audio signal, and in that the control means are arranged for limiting (minimize) a combined power gain measure of the processed audio signals to a predetermined value (predetermined of period of time) without measuring an energy transfer at each site where each respective one the plurality of audio sources receives the input audio signals (see fig.1 (10) and col.3 15-col.4 15).

Consider claim 10, there is a method claim corresponding to apparatus claim 8. See previous apparatus claim 8 rejection.

Consider claim 9, Oh teaches an audio signal processing arrangement of the characterized in that the processing means (see fig.1, (16)) comprise scaling means

((10) for scaling different distance from audio source to a microphone)) for scaling the input audio signals with a scaling factor (microphone) for obtaining the processed audio signals, said control means (14) comprise further scaling means ((10) for scaling different distances from audio source to a microphone) for deriving a plurality of scaled combined audio signals with a scaling factor(microphone) corresponding to the scaling factor of the scaling means ((10) for scaling different distances from audio source to a microphone), and in that the control means (14) are arranged for maximizing (larger) a power measure of the combined audio signal, and for limiting a combined power gain measure of the processed audio signals by minimizing a difference between the input signals and the scaled combined audio signals corresponding to said audio signals (seecol.3 line 15-col.4 line15).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oh (US PAT 5,353,376) in view of Kellermann (US PAT 5,602,962).

Consider claim 3, Oh does not teach clearly the audio processing arrangement of the processor includes a plurality of adjustable filters for deriving the processed audio

signal, in that the controller includes a plurality of further adjustable filters having a transfer function being the conjugate of the transfer function of the adjustable filters, said further adjustable filters being arranged for deriving from the combined audio signal filtered combined audio signals, and in that the controller is arranged for maximizing the power measure of the combined audio signal, and for restricting a combined power gain measure of the processed audio signals to a predetermined value by controlling the transfer function of the adjustable filters and the further adjustable filters in order to minimize a difference measure between the input audio signals and the filtered combined audio signal corresponding to said input audio signals.

However, Kellermann teaches the audio processing arrangement wherein the processor includes a plurality of adjustable filters (see fig.1, #3, #5, #6) for deriving the processed audio signal, in that the controller includes a plurality of further adjustable filters having a transfer function being the conjugate of the transfer function of the adjustable filters (see fig.1, #3, #5, #6 and col.4 line 55-col.5 line 2), said further adjustable filters being arranged for deriving from the combined audio signal filtered combined audio signals, and in that the controller is arranged for maximizing the power measure of the combined audio signal (see col.3 line 45-col.4 line 55), and for restricting a combined power gain measure of the processed audio signals to a predetermined value by controlling the transfer functions of the adjustable filters and the further adjustable filters in order to minimize a difference measure between the input audio signals and the filtered combined audio signal corresponding to said input audio signals (see fig.2 and col.4 line 53-col.5 line).

Therefore, it would obvious to one of ordinary skill in the art at the time invention was made to combine the teaching of Kellermann into Oh to provide reduction of noise components of the microphone signals is achieved and the audibility of speech is further improved.

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oh (US PAT 5,353,376) in view of Kaneda (US PAT 4,536,887).

Consider claim 6, Oh does not teach clearly the audio processing arrangement of the microphones are placed around a center position at angles being equal to 360 degrees divided by the number of microphones.

However, Kaneda discloses that the audio processing arrangement includes that the microphones are placed around a center position at angles being equal to 360 degrees divided by the number of microphones (see fig.21d and col.20 line 10-col.21 line 20).

Therefore, it would obvious to one of ordinary skill in the art at the time invention was made to modify Kellermann 's to provide microphone-array apparatus which can be constructed on a small scale and permits adaptive selection of the desired signal for varied positions of a desired signal and noise sources.

Response to Arguments

7. Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to: (703) 872-9314

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lao,Lun-See whose telephone number is (703) 305-2259. The examiner can normally be reached on Monday-Friday from 8:00 to 6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz, can be reached on (703) 305-4708.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 whose telephone number is (703) 306-0377.

Lao,Lun-See
Patent Examiner
US Patent and Trademark Office
Crystal Park 2
(703)305-2259

Duc Nguyen
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PRIMARY EXAMINER